NOTES ON A CASE OF GENERAL PARESIS WITH SPECIAL REFERENCE TO THE STUDY OF THE RELATIONS BETWEEN THE TEMPERATURE, PULSE RATE AND RESPIRATION.

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ABOUT two years and a half ago Drs. Peterson and Langdon made some observations regarding the temperature in cases of general paralysis, and the results of these observations were published in an article which appeared in the JOURNAL OF NERVOUS AND MENTAL DISEASE, November, 1893, entitled, " A Study of the Temperature in Twenty-five Cases of General Paresis of the Insane." The conclusions they arrived at were as follows, viz.:

1. As regards the average bodily temperature, we find it to correspond to physiological normes. The statements of our predecessors as to hyperpyrexia, or subnormal averages cannot be sustained.

2. The diurnal oscillations of temperature in paretics also correspond to physiological normes. The statements to be found in literature as to extraordinary daily variations being frequent in these cases are absolutely erroneous.

3. Asymmetrical axillary differences are so small that they cannot be considered as abnormal and certainly not of any diagnostic significance.

4. When unusual variations occur in general paretics their cause must be sought for in conditions not related to the pathological phenomena of paralytic dementia, but depending upon thermogenic features unrecognized by the physician, or "masked" by the mental state of the patient. Thus in case two of our series an increasing hyperpyrexia was noted during the second week's observation, but the pneumonia causing it was "masked" until the fifth or sixth day, patient dying on the sixth day. Again, in case ten, where the highest single daily oscillation was 3.4°, and the average daily oscillation for the week 2.2°, patient suffered from bed sores which

undoubtedly produced some septicæmia. That variations in temperature may take place in connection with the paralytic and convulsive seizures of these cases, we do not gainsay, but we have made no observations under such circumstances.

I would say here, that I was an assistant at the Hudson River State Hospital at the time these observations were made, and became much interested in the subject, and feel certain that they were made with as much accuracy as possible, although in my opinion, there was not enough discrimination shown in the selection of the cases in order to secure the most trustworthy statistics. Thus all the cases of general paralysis in the male department were observed regardless of whether these cases were in the second or third stage of the malady, or whether they were cases of dementia paralytica or paralytic insanity, accompanied with more or less motor restlessness, or whether they were exposed to circumstances which would cause unnecessary cerebral excitement

In the case under consideration, I not only made similar observations concerning the temperature, but also went a step further and endeavored to ascertain the relation of the pulse rate and the respiration to the temperature, that is, whether they held a definite ratio to each other, or not.

I wish to state, in passing, that I had a competent nurse make the following records and can vouch for their accuracy. The nurse was directed that the patient should be perfectly quiet for at least twenty minutes before making the records of the temperature, pulse and respiration.

Before proceeding further a brief survey of the patient's previous history may be of interest.

A. B., male, age on admission 45 years; native of United States; single; lungs and heart normal. Contracted syphilis in 1883, and had secondary lesions of the skin. Had been treated for syphilis.

Exciting causes of malady are said to be excessive devotion to business, and sexual excess. Predisposing cause; syphilis. The patient showed symptoms of mental disturbance in the summer of 1890, and in the fall of the same year was seen by an eminent alienist who was of the opinion that paresis would probably develop. Subsequently the patient was taken to Europe, and there subjected to a course of anti-syphilitic treatment, but without obtaining any beneficial results, mentally or physically. The patient was admitted to Greenmont, September 30, 1892, and was found to be in the first stage of dementia paralytica.

In June, 1894, I made some observations concerning the relations between the temperature, pulse rate, and respiration which extended over a period of two weeks, namely, from June 1 to 14, inclusive, the records being made between the hours of 7 A.M. and 9 P.M. daily. The patient, at this time, was well advanced in the second stage of his malady. He was always in a reclining posture when the above named records were made. On consulting the accompanying charts and tables, it will be seen that during the first seven days, although the oscillations of temperature were comparatively slight, the temperature ranged above normal, except in three instances. The greatest diurnal variation during this period was between 98° and 99.$\frac{4}{5}$, which was noted on the 6th inst. The highest temperature reached during the week was at 7 A.M. on the morning of the 5th inst., which was 100.$\frac{2}{5}$°. The patient was reported to have slept badly during the night, and to have been very violent during the day.

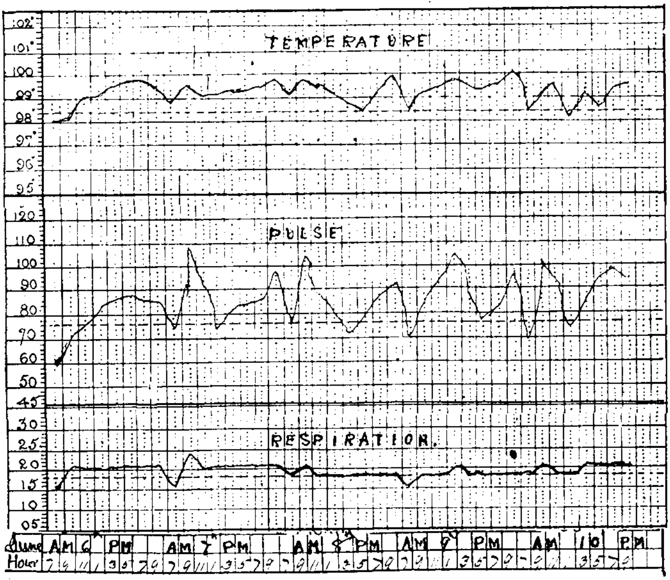

CHART I. Showing the relation between A. B's. Temperature, Pulse and Respiration from June 6th to 10th inclusive, 1894.

By a careful examination of the chart and table it will be seen that the ratio between the temperature and pulse is very variable and that they hold no definite relation to each other. The same may be said of the ratio between the pulse and the respiration. The most marked instance of variation from the usual ratio between the temperature, pulse rate and respiration was noted on the 5th inst., at 7 A. M., when the temperature registered $100.\frac{2}{5}^\circ$, the pulse 68 and the respiration 16.

In the chart and table showing the temperature, pulse rate, and respiration from June 8th to 14th, inclusive, there is nothing of further interest, except that on the 11th inst. at 7 A. M., the temperature registered $100.\frac{3}{5}^\circ$, and patient was reported to have had a slight convulsion lasting for twenty minutes. The greatest diurnal variation during this period was $1.\frac{2}{5}$ which occurred on the 14th inst.

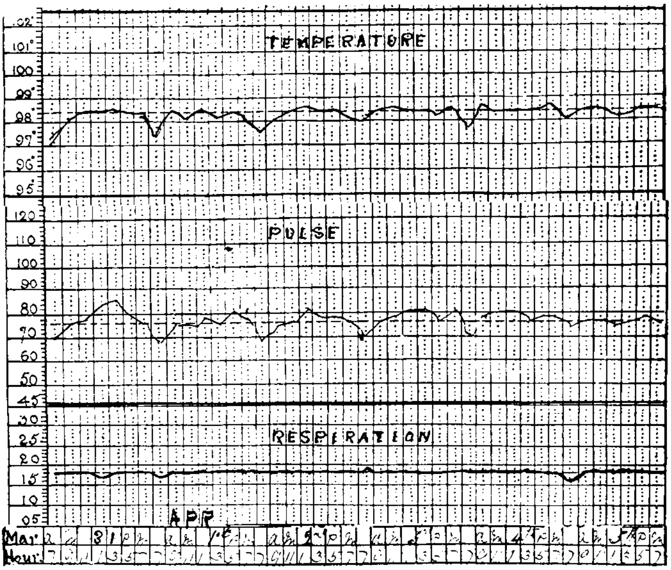

CHART 2. Showing the relation between the nurse's Temperature, Pulse, and Respiration from March 31st to April 5th inclusive, 1895.

On Feb. 21st, 1895 I renewed my observations of the previous June. The patient was at this time in the third stage of general paralysis and was confined to his room. During the first few weeks, he sat in a reclining chair for a part of each day, but later on was entirely bed-ridden. The endeavor was made to be as accurate as possible, the records not being made until the patient had remained perfectly quiet in his reclining chair, or bed for at least twenty minutes. Although the pulse and respiration become very variable, even in health on slight provocation, still by making a careful study of the charts and tables covering a series of weeks, it will be seen, that their relation to each other and to the temperature is more variable than under normal circumstances, the same precautions for accuracy having been taken. Thus from March 31st to April 5th, inclusive, I had the nurse take his own temperature, pulse rate, and respiration at the same hours as he took those of the patient. By comparing the two charts for those dates, a great contrast will be observed.

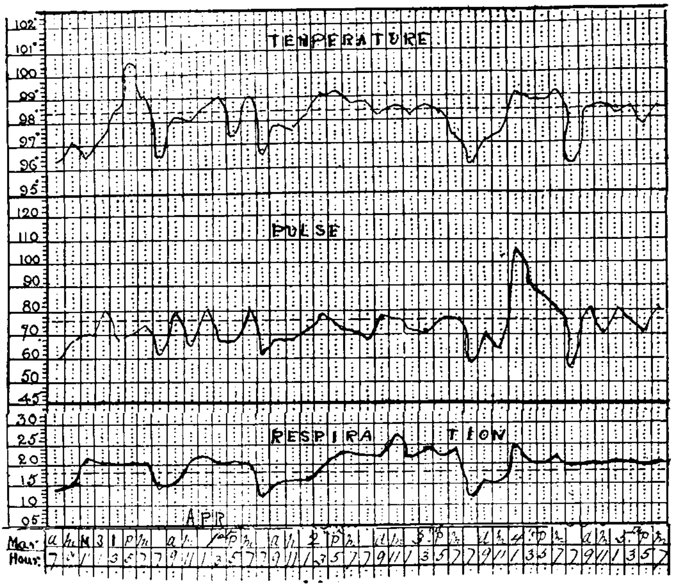

CHART 3. Showing the relation between A. B.'s Temperature, Pulse and Respiration from March 31st to April 5th inclusive, 1895.

I also give the records of the convulsions, and the hours at which the most of them occurred, in order that a study may be made between the occurrence of the con-

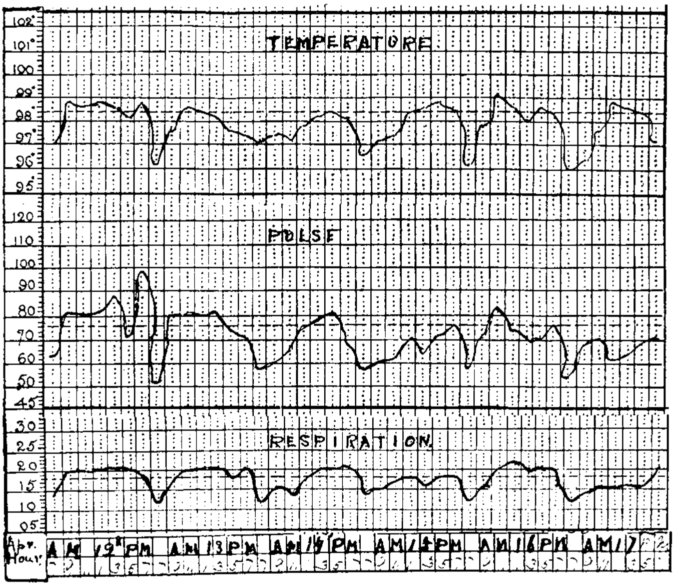

CHART 4. Showing the relation between A. B.'s Temperature, Pulse and Respiration from April 12th to 17th inclusive, 1895.

vulsions and the condition of the bodily temperature. From a study of the present case, these two conditions seem to be entirely independent of each other.

In this case both general and localized convulsions were very frequent. Spasms of one or both eye-lids occurred at times without any other noticable convulsive movement. Thus on March 13th patient had a spasmodic closure of the right eye-lid lasting for three hours; and the nurse was unable to open it, except by force.

The patient was also subject to spasmodic contractions of the laryngeal muscles, as sometimes occurs in locomotor ataxy, followed by cyanosis, dyspnoea, and cough, lasting at times, four or five minutes. After cessation of the laryngeal spasm, the cough would be quite severe while large quantities of mucus would be secreted and would have to be removed from the fauces by means of a swab, and by spraying the nose and pharynx. One of these attacks is thus described in the daily report. "At 1.10 P. M., my attention was directed toward patient who was making a gurgling sound in his throat, as though choking. At the same time he was making frantic efforts with his hands as though to pull something out of his throat. He was dark purple in face, and gasping for breath, these symptoms lasting fully five minutes. I raised patient somewhat and lightly tapped him on chest, and after a time the tapping seemed to relieve him somewhat, and then he began to cough; a regular bronchial cough, which lasted twenty minutes. Was very exhausted and unable to articulate for three hours, after which time could only say a word with great difficulty. During these attacks, both before and after, the temperature remained very low."

About a week before death the patient developed a mild attack of bronchitis, and the mucus was secreted so abundantly that the patient became almost asphyxiated thereby, not having strength enough to cough it up. The most efficient means adopted for the relief of this condition was to thoroughly spray the nose and fauces with a warm salt solution. This afforded marked and prompt relief to the patient. The warm salt solution would liquify the mucus collected in the fauces and would also induce coughing, and by placing the patient on the abdomen, the mucus would run copiously from the mouth. The relief thus obtained would often last for an hour, or two. Thus on April 26th the nurse reports having removed as much as the equivalent of five teacupsful of mucus during the day.

I here append comparative charts and tables showing the relation that the temperature, pulse rate, and respiration held to each other in the daytime, from Feb. 21st to April 18th, inclusive, and the greatest diurnal variation in temperature in each seven days. The lowest temperature reached is not recorded on these charts. At 3 A. M., on the morning of April 16th, patient had a convulsion. The temperature then registered $95.\frac{4}{5}$, pulse 70, respiration 31. I found practically no difference between the temperatures on the right and left sides of the body, and thus have made no records concerning them.

On and after April 24th complications developed, and as a result much wider oscillations occurred in the temperature, pulse rate and respiration. The patient died May 1st, 1895.

Again referring to Dr. Peterson's article, he says in the fourth conclusion, "When unusual variations of temperature occur in general paretics, their cause must be sought for in conditions not related to the pathological phenomena of paralytic dementia, but depending on thermogenic features unrecognized by the physician, or masked by the mental state of the patient."

In the case under consideration no cause, or causes existed to produce the variations in temperature described except those purely attributable to the general paralysis as such. It must be remembered also that from Feb. 21st to April 18th, inclusive, when these observations were made, the patient was confined to his room, which was kept at a uniform temperature and that these observations were made in the spring, when the external thermometric changes were comparatively slight, and were not made in the summer, when the atmospheric temperature is generally high during the twenty-four hours, causing the patient to become restless, irritable, and more susceptible to variations in the bodily temperature, owing to more or less sweating, prolonged diarrhœa, hemorrhages, or general exhaustion.

It would seem to the writer that a great deal of light might be thrown upon the relations of the temperature, pulse rate, and respiration in general paralysis, if a careful study of these cases was made, and at the same time afford a basis for the study of the progressive morbid changes which occur in the sympathetic nervous system.

In order to make an accurate study of these phenomena, the cases to be observed must be very carefully selected. Thus cases of general paralysis in which frequent attacks of motor restlessness occur must necessarily be eliminated, even if these patients are confined to their beds, as the effect of the heart and respiration will be such that the observations will be of no practical value. Each patient should be in a separate room, or a few patients can be associated in a small isolated section of the ward, in order to eliminate as far as possible all external causes of cerebral excitement; and the rooms, or dormitory should be kept at a uniform temperature. The observations will be more accurate if made in the spring, or fall, when the variations in the atmospheric temperature are comparatively slight. The observations must be considered as valueless, if serious complications supervene, such as a severe general bronchitis, pneumonia, profuse, and prolonged diarrhœa, etc., etc. Here and there, in every large hospital for the insane, cases can be found which are most favorable for study, and these are cases typical of the fundamental form of General Paralysis of the Insane, known as Dementia paralytica, which is so carefully described by Regis. It is far better to select our cases, and extend our observations over a series of years, and have them approximately correct, than to make a large number of observations and run the risk of having the results of our studies untrustworthy.

TABLE SHOWING GREATEST DIURNAL VARIATIONS IN TEMPERATURE FOR EACH WEEK, FROM 7 A M. TO 9 P.M.

		Degrees.
February 21 to 28th,	inclusive,	2.$\frac{1}{5}$.
March 1 to 7,	"	5.$\frac{2}{5}$.
March 8 to 14,	"	2 $\frac{2}{5}$.
March 15 to 21,	"	3.$\frac{1}{5}$.
March 22 to 28,	"	3.$\frac{4}{5}$.
March 29 to April 4,	"	3.
April 5 to 11,	"	2.$\frac{2}{5}$.
April 12 to 18,	"	2.$\frac{2}{5}$.

TABLE OF CONVULSIONS.

Dates and hours of occurrence of convulsive seizures, from February 21 to 28, inclusive :

February 21, 1895.	Slight convulsions.	In afternoon.
February 22, "	Severe convulsions lasting for one hour.	3.30 p.m.
February 23, "	Severe convulsions of right side, lasting forty minutes.	In afternoon.
February 24, "	Severe convulsions lasting one-half hour.	3.30 p.m.
February 25, "	Severe laryngeal spasm lasting for five minutes, followed by severe coughing spell.	1. 10 p.m.
	Swallowing often difficult. Often has spasms of either one or both eyelids quite independent of spasms of other parts of the face.	
February 26, "	Laryngeal spasm lasting for five minutes.	2 p.m.
	Slight facial spasm.	5.30 p.m.
	Complains of pain in the head. Keeps hand on head, on left side towards back part.	
February 27, "	General convulsions lasting twenty minutes.	5.10 p.m.

Dates and hours of occurrence of convulsive seizures. from March 1 to 7, inclusive:

March 1, 1895.	Had slight convulsions and two fainting attacks.	During afternoon.
March 2, “	Convulsion of jaw.	7. a.m.
March 6, “	Convulsion of right side of face and of right eyelid.	6.45 a.m.
	Right eyelid closed tight and could not be opened without using force. Spasm continued until 8 a.m.	
	Convulsion of lower limbs.	8.15 a.m.
	Laryngeal spasm.	9.15 a.m.
	Laryngeal spasm.	6.30 p.m.
March 7, “	Convulsions of left side of face.	8.40 a.m.
	General convulsion.	9 30 a.m.
	Convulsion of right arm.	3.30 p.m.
	Lost use of lower limbs from	6 to 8 p.m.

Dates and hours of occurrence of convulsive seizures, from March 8 to 14, inclusive:

March 8, 1895.	Convulsion.	3.30 p.m.
	Fainting attacks at intervals during the day.	
March 9, “	Convulsions.	4 p.m.
March 10, “	Slight facial convulsions.	In morning.
	Laryngeal spasm.	In afternoon.
March 13, “	Spasm of right eyelid lasting for three hours.	In morning.

Dates and hours of occurrence of convulsive seizures, from March 15 to 21, inclusive:

March 15, 1895.	Laryngeal spasm.	1 p.m.
	Facial convulsions.	5.30 p m.
March 16, “	Severe convulsions.	2.40 p.m.
March 20, “	Convulsions of left side of body and laryngeal spasm.	1 a m.
March 21, “	Convulsion of right side of face. Right eyelid closed for seven hours.	

Dates and hours of occurrence of convulsive seizures, from March 22 to 28, inclusive:

March 22, 1895	Convulsions and laryngeal spasm.	11 a.m.
March 23, “	Convulsions.	1 p m.
	Convulsions.	10 p.m.
	Frequent coughing spells.	
March 24, “	Convulsions from	10.30 to 11.15 a m.
March 26, “	Convulsions from	7 a.m. to 1 p.m
	Convulsions followed by coughing spell.	10.20 p.m
	Patient had seventeen convulsions during these twenty-four hours	

March 27, "	Convulsions.	2.30 p.m.
March 28, "	General convulsions.	7 a.m.
	General convulsions.	1 p.m.
	General convulsions followed by laryngeal spasm.	1.30 p.m.

Dates and hours of occurrence of convulsive seizures, from March 29 to April 4, inclusive :

March 29, 1895.	Three attacks of convulsions on left side of face between	9 and 10 a.m.
	Laryngeal spasm.	6.25 p.m.
March 30, "	General convulsions.	1.15 p.m.
March 31, "	Convulsions.	In afternoon.
April 1, "	Convulsions.	During day.
April 3, "	Frequent attacks of convulsions during night. Had several convulsions followed by violent attack of coughing.	3.15 p.m.
April 4, "	Convulsions followed by violent coughing.	1.20 p.m.
	Convulsions.	10 a.m.
	Convulsions.	1 p.m.

Dates and hours of occurrence of convulsive seizures, from April 5 to 11, inclusive :

April 5, 1895.	Frequent laryngeal convulsions.	During night.
April 6, "	Facial convulsions.	7 a.m
	Facial convulsions.	9 a.m.
April 8, "	Four general convulsive attacks.	During the day.
April 9, "	Convulsions during night, followed by coughing attacks.	
April 10, "	General convulsions.	6 30 p.m.
April 11, "	General convulsions.	2.40 a.m.

Dates and hours of occurrence of convulsive seizures, from April 12 to 18, inclusive :

April 12, 1895.	General convulsions.	7.15 a m.
April 15, "	General convulsions.	11.10 p.m.
April 16, "	General convulsions.	3 a.m.
	General convulsions.	11.30 a.m.
April 17, "	Convulsions of face.	2.10 p.m.
April 18, "	General tonic spasm.	7 p.m.